

CLAIMS

What is claimed is:

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- Sub B1
1. A method for determining display element attribute values from an object represented by said display element, the method comprising:
- 10 defining a first view for said display element, said first view including at least one elementary view, each display element having one or more attributes, each attribute having an attribute value, each elementary view capable of determining a display element attribute value;
- 15 receiving a display element attribute value request;
- determining said first view for said display element; and
- ascertaining at least one display element attribute value for said display element based upon said first view.
2. The method of claim 1 wherein said determining further comprises:
- indicating said first view is the view defined for said display element when a view is defined for said display element; and
- 20 indicating said first view is the view defined for a parent of said display element when a view is not defined for said display element.
3. The method of claim 1 wherein said ascertaining further comprises:
- receiving a display element;
- ascertaining an attribute value for said display element using an elementary view
- 25 when said first view is an elementary view; and

ascertaining an attribute value for said display element using a composite view when said first view is a composite view.

- 5 4. The method of claim 3 wherein said ascertaining an attribute value for said display element using an elementary view further comprises:

receiving a request for a display element attribute value using an elementary view;  
returning an indication that no values are defined when said elementary view is incompatible with said object;

- 10 returning an indication that no values are defined when said attribute value is undefined for said object; and  
returning at least one attribute value when at least one value for said attribute is defined for said object.

- 15 5. The method of claim 4 wherein said returning at least one attribute value further comprises returning an attribute value when said attribute is single-valued.

6. The method of claim 4 wherein said returning at least one attribute value further comprises returning a plurality of attribute values when said attribute is multi-valued.

- 20 7. The method of claim 3 wherein said ascertaining an attribute value for said display element using a composite view further comprises:

receiving a request for a display element attribute value using a composite view;  
searching each view contained by said composite view for a value for said attribute  
25 and returning said value when said attribute is single-valued;

collecting all values for said attribute for each view contained by said composite view

when said attribute is multi-valued;

merging said values obtained by said collecting; and

5 returning said merged values.

8. The method of claim 1, further comprising:

receiving a first view for a display element;

receiving a second view for said display element, said second view including

10 attributes not found in said first view;

combining said first view and said second view to create a third view; and

displaying attribute values for said display element using said third view.

9. The method of claim 1, further comprising:

15 receiving a first view for a display element, said first view including at least one

multi-valued attribute;

adding an elementary view to said first view, said elementary view including at least

one additional value for said at least one multi-valued attribute; and

displaying attribute values for said display element using said first view.

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10. The method of claim 1, further comprising:

receiving a first view for a first display element;

receiving a second view for a second display element;

combining said first view and said second view to create a third view; and

25 displaying attribute values for said display element using said third view.

11. The method of claim 1, further comprising:

changing said first view for at least one display element to a second view; and  
displaying attribute values for said at least one display element after said changing  
5 according to said second view.

12. The method of claim 11 wherein said changing comprises adding an elementary view.

13. The method of claim 11 wherein said changing comprises removing an elementary  
10 view.

14. The method of claim 11 wherein

said first view comprises at least one containment relationship between the object  
associated with said display element and the objects associated with said at least  
15 one other display element; and  
said second view comprises at least one inheritance relationship between the object  
associated with said display element and the objects associated with said at least  
one other display element.

15. The method of claim 1 wherein said displaying further comprises displaying said  
20 object values for said composite view in a tree structure.

16. The method of claim 1 wherein

said object comprises a program unit; and

25 said program is written in a language that supports inheritance relationships between  
objects.

17. The method of claim 16 wherein said program is written in the Java™ language.

5 18. The method of claim 16 wherein said program is written in the C++ language.

19. The method of claim 1 wherein said object is a file that is part of a file system.

20. A program storage device readable by a machine, embodying a program of

10 instructions executable by the machine to perform a method to determine display element attribute values from an object represented by said display element, the method comprising:

defining a first view for said display element, said first view including at least one

15 elementary view, each display element having one or more attributes, each attribute having an attribute value, each elementary view capable of determining a display element attribute value;

receiving a display element attribute value request;

determining said first view for said display element; and

ascertaining at least one display element attribute value for said display element based

20 upon said first view.

21. The program storage device of claim 20 wherein said determining further comprises:

indicating said first view is the view defined for said display element when a view is

defined for said display element; and

indicating said first view is the view defined for a parent of said display element  
when a view is not defined for said display element.

- 5 22. The program storage device of claim 20 wherein said ascertaining further comprises:  
receiving a display element;  
ascertaining an attribute value for said display element using an elementary view  
when said first view is an elementary view; and  
ascertaining an attribute value for said display element using a composite view when  
10 said first view is a composite view.

23. The program storage device of claim 22 wherein said ascertaining an attribute value  
for said display element using an elementary view further comprises:  
receiving a request for a display element attribute value using an elementary view;  
15 returning an indication that no values are defined when said elementary view is  
incompatible with said object;  
returning an indication that no values are defined when said attribute value is  
undefined for said object; and  
returning at least one attribute value when at least one value for said attribute is  
20 defined for said object.

24. The program storage device of claim 23 wherein said returning at least one attribute  
value further comprises returning an attribute value when said attribute is single-  
valued.

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25. The program storage device of claim 23 wherein said returning at least one attribute value further comprises returning a plurality of attribute values when said attribute is multi-valued.

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26. The program storage device of claim 22 wherein said ascertaining an attribute value for said display element using a composite view further comprises:  
receiving a request for a display element attribute value using a composite view;  
searching each view contained by said composite view for a value for said attribute  
10 and returning said value when said attribute is single-valued;  
collecting all values for said attribute for each view contained by said composite view  
when said attribute is multi-valued;  
merging said values obtained by said collecting; and  
returning said merged values.

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27. The program storage device of claim 20, said method further comprising:  
receiving a first view for a display element;  
receiving a second view for said display element, said second view including  
attributes not found in said first view;  
20 combining said first view and said second view to create a third view; and  
displaying attribute values for said display element using said third view.

28. The program storage device of claim 20, said method further comprising:  
receiving a first view for a display element, said first view including at least one  
25 multi-valued attribute;

adding an elementary view to said first view, said elementary view including at least one additional value for said at least one multi-valued attribute; and displaying attribute values for said display element using said first view.

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29. The program storage device of claim 20, said method further comprising:

receiving a first view for a first display element;

receiving a second view for a second display element;

combining said first view and said second view to create a third view; and

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displaying attribute values for said display element using said third view.

30. The program storage device of claim 20, said method further comprising:

changing said first view for at least one display element to a second view; and

displaying attribute values for said at least one display element after said changing

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according to said second view.

31. The program storage device of claim 30 wherein said changing comprises adding an elementary view.

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32. The program storage device of claim 30 wherein said changing comprises removing an elementary view.

33. The program storage device of claim 30 wherein

said first view comprises at least one containment relationship between the object

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associated with said display element and the objects associated with said at least one other display element; and



said second view comprises at least one inheritance relationship between the object associated with said display element and the objects associated with said at least one other display element.

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34. The program storage device of claim 20 wherein said displaying further comprises displaying said object values for said composite view in a tree structure.

35. The program storage device of claim 20 wherein

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said object comprises a program unit; and

said program is written in a language that supports inheritance relationships between objects.

36. The program storage device of claim 35 wherein said program is written in the Java™ language.

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37. The program storage device of claim 35 wherein said program is written in the C++ language.

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38. The program storage device of claim 20 wherein said object is a file that is part of a file system.

39. An apparatus for determining display element attribute values from an object represented by said display element, the apparatus comprising:
- means for defining a first view for said display element, said first view including at least one elementary view, each display element having one or more attributes, each attribute having an attribute value, each elementary view capable of determining a display element attribute value;
- means for receiving a display element attribute value request;
- means for determining said first view for said display element; and
- means for ascertaining at least one display element attribute value for said display element based upon said first view.
40. The apparatus of claim 39 wherein said means for determining further comprises:
- means for indicating said first view is the view defined for said display element when a view is defined for said display element; and
- means for indicating said first view is the view defined for a parent of said display element when a view is not defined for said display element.
41. The apparatus of claim 39 wherein said means for ascertaining further comprises:
- means for receiving a display element;
- means for ascertaining an attribute value for said display element using an elementary view when said first view is an elementary view; and
- means for ascertaining an attribute value for said display element using a composite view when said first view is a composite view.

42. The apparatus of claim 41 wherein said means for ascertaining an attribute value for said display element using an elementary view further comprises:

means for receiving a request for a display element attribute value using an

5 elementary view;

means for returning an indication that no values are defined when said elementary

view is incompatible with said object;

means for returning an indication that no values are defined when said attribute value

is undefined for said object; and

10 means for returning at least one attribute value when at least one value for said

attribute is defined for said object.

43. The apparatus of claim 42 wherein said means for returning at least one attribute value further comprises means for returning an attribute value when said attribute is  
15 single-valued.

44. The apparatus of claim 42 wherein said means for returning at least one attribute value further comprises means for returning a plurality of attribute values when said attribute is multi-valued.

20 45. The apparatus of claim 41 wherein said means for ascertaining an attribute value for said display element using a composite view further comprises:

means for receiving a request for a display element attribute value using a composite view;

25 means for searching each view contained by said composite view for a value for said attribute and returning said value when said attribute is single-valued;

means for collecting all values for said attribute for each view contained by said  
composite view when said attribute is multi-valued;  
means for merging said values obtained by said collecting; and  
5 means for returning said merged values.

46. The apparatus of claim 39, further comprising:

means for receiving a first view for a display element;  
means for receiving a second view for said display element, said second view  
10 including attributes not found in said first view;  
means for combining said first view and said second view to create a third view; and  
means for displaying attribute values for said display element using said third view.

47. The apparatus of claim 39, further comprising:

15 means for receiving a first view for a display element, said first view including at  
least one multi-valued attribute;  
means for adding an elementary view to said first view, said elementary view  
including at least one additional value for said at least one multi-valued attribute;  
and  
20 means for displaying attribute values for said display element using said first view.

48. The apparatus of claim 39, further comprising:

means for receiving a first view for a first display element;  
means for receiving a second view for a second display element;  
25 means for combining said first view and said second view to create a third view; and  
means for displaying attribute values for said display element using said third view.

49. The apparatus of claim 39, further comprising:

means for changing said first view for at least one display element to a second view;

5 and

means for displaying attribute values for said at least one display element after said  
changing according to said second view.

50. The apparatus of claim 49 wherein said means for changing comprises a means for  
10 adding an elementary view.

51. The apparatus of claim 49 wherein said means for changing comprises a means for  
removing an elementary view.

15 52. The apparatus of claim 39 wherein ~~A~~  
said first view comprises at least one containment relationship between the object  
associated with said display element and the objects associated with said at least  
one other display element; and  
said second view comprises at least one inheritance relationship between the object  
20 associated with said display element and the objects associated with said at least  
one other display element.

53. The apparatus of claim 39 wherein said means for displaying further comprises a  
means for displaying said object values for said composite view in a tree structure.

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54. The apparatus of claim 39 wherein

said object comprises a program unit; and

said program is written in a language that supports inheritance relationships between

5 objects.

55. The apparatus of claim 54 wherein said program is written in the Java™ language.

10 56. The apparatus of claim 54 wherein said program is written in the C++ language.

57. The apparatus of claim 39 wherein said object is a file that is part of a file system.

58. An apparatus for determining display element attribute values from an object

15 represented by said display element, the apparatus comprising:

a view definer to define a first view for said display element, said first view including

at least one elementary view, each display element having one or more attributes,

each attribute having an attribute value, each elementary view capable of

determining a display element attribute value;

20 a receiving interface to receive a display element attribute value request;

a view determiner to determine said first view for said display element; and

a view ascertainment to ascertain at least one display element attribute value for said

display element based upon said first view.

59. The apparatus of claim 58 wherein said view determiner is further configured to indicate said first view is the view defined for said display element when a view is defined for said display element; and
- 5 indicate said first view is the view defined for a parent of said display element when a view is not defined for said display element.
60. The apparatus of claim 58 wherein said view ascertainment is further configured to ascertain an attribute value for said display element using an elementary view when
- 10 said first view is an elementary view; and
- ascertain an attribute value for said display element using a composite view when said first view is a composite view.
61. The apparatus of claim 58 wherein said view ascertainment is further configured to
- 15 receive a request for a display element attribute value using an elementary view; return an indication that no values are defined when said elementary view is incompatible with said object;
- return an indication that no values are defined when said attribute value is undefined for said object; and
- 20 return at least one attribute value when at least one value for said attribute is defined for said object.
62. The apparatus of claim 61 wherein said view ascertainment is further configured to return an attribute value when said attribute is single-valued.

63. The apparatus of claim 61 wherein said view ascertainment is further configured to return a plurality of attribute values when said attribute is multi-valued.

5 64. The apparatus of claim 60 wherein said value ascertainment is further configured to receive a request for a display element attribute value using a composite view; search each view contained by said composite view for a value for said attribute and return said value when said attribute is single-valued; collect all values for said attribute for each view contained by said composite view  
10 when said attribute is multi-valued; merge said values; and return said merged values.

65. The apparatus of claim 58, further comprising a view changer to change said first  
15 view for at least one display element to a second view.

66. The apparatus of claim 65 wherein said view changer is further configured to add an elementary view to said view.

20 67. The apparatus of claim 65 wherein said view changer is further configured to remove an elementary view from said view.

68. The apparatus of claim 65 wherein  
said first view comprises at least one containment relationship between the object  
25 associated with said display element and the objects associated with said at least one other display element; and



said second view comprises at least one inheritance relationship between the object associated with said display element and the objects associated with said at least one other display element.

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69. The apparatus of claim 58 wherein said display interface is further configured to display said object values for said composite view in a tree structure.

70. The apparatus of claim 58 wherein

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said object comprises a program unit; and  
said program is written in a language that supports inheritance relationships between objects.

71. The apparatus of claim 70 wherein said program is written in the Java™ language.

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72. The apparatus of claim 70 wherein said program is written in the C++ language.

73. The apparatus of claim 58 wherein said object is a file that is part of a file system.

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